DOCUMENT RESUME

ED 069 408 PS 006 137

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TITLE Risk-Taking Behavior in Children.
PUB DATE 7 Apr 72
NOTE 5p.; Paper presented at the Annual Meeting of the Southeastern Psychological Assoc., Atlanta, Ga., April 7, 1972

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Analysis of Variance; Bibliographies; Cognitive Measurement; *Cognitive Processes; Grade 4; *Personality Assessment; *Research Methodology; *Risk; *Sex Differences; Speeches; Statistical Analysis; Technical Reports; Tests

ABSTRACT

The relationship between sex of the experimenter and of a child's cognitive style on risk-taking behavior is reported. The Subjects were 30 boys and 30 girls in the fourth grade. An adult female experimenter administered Kagan's Matching Familiar Figures task to half the children of each sex to give a measure of the childrens' reflective or impulsive cognitive style. An adult male administered the task to the other half. Then the children were given a risk-taking task which consisted of ten toggle switches in the off position. Nine of the switches are safe; for each one the child moves a light comes on and the child received two cents. The tenth switch turns on a buzzer and the child must return his winnings. Two-way analysis of variance tests were done on the three dependent variables. The only significant difference among these four groups was between boys and girls with a male experimenter. Girls took significantly more risks when working with the male experimenter. Expected relationships between risk-taking and cognitive style measures did not appear. A review of risk-taking studies is included in the introduction. Replication of the sex difference is recommended. (DJ)

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# Risk-Taking Behavior in Children[1]

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Persons frequently make decisions in a variety of situations which involve some degree of risk. Risk-taking situations require a person to examine the probabilities of success or failure associated with alternative behaviors he may perform and then to make a decision concerning what he will do. Psychologists have only infrequently examined the correlates and determinants of risk-taking behavior in children.

There are many different settings in which children make decisions with some degree of risk. Investigators have generally divided these settings into two classes: those involving chance and those involving skills.

In skill situations, the odds of a child winning or losing depend on either his ability to solve new problems or on skills he possesses already. Thus, a child lacking such skills may be at a disadvantage in these risk-taking situations. For example, a child may decide whether or not to attempt learning a new math or reading task as a function of his past history of reinforcement and his expectation concerning the future probability of reinforcement. If a class is divided into two teams in order to have a spelling bee, a poor speller increases the risk that his team will lose and that he or she will be criticized openly. In experiments, level-of-aspiration-type tasks have been used to assess risk-taking in skill situations. For example, children have been asked on a series of trials to choose the distance from which they will throw a ring on a peg (McManis & Bell, 1968) or throw a volleyball into a basket (deCharms & Davis, 1965). They also have been asked to set the distance between two goal posts through which they will attempt to push a penny puck ("shuffleboard" task of Pankove & Kogan, 1968).

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In chance situations the odds of winning and losing may or may not be known precisely; however, the odds may usually be estimated, and the influence of intelligence or skill level on success is negligible. For example, if a strange child comes into a classroom, the other children decide whether to take risks in becoming acquainted with him or her. In playing some card games a child takes a risk in deciding whether to take a card discarded by an opponent or one from the stack of undealt cards. In experiments, one frequently used task to assess risk-taking in chance situations could be called the "toggle-switch" game (Slovic, 1966; West, Fretz, & MacDonald, 1970). In this game a child is faced with 10 switches in the off position. Nine of the switches are "safe" (or "good") switches; for each one the child moves, a light comes on and he or she wins a small prize. The tenth switch is a "danger" (or "bad") switch; if the child moves this switch, a buzzer sounds and all previous winnings are lost. On this task the child has the option of stopping voluntarily after he has moved any number of safe switches. This was the task used in the present experiments; the prize offered a child was two cents for each safe

switch moved.

Although little systematic research has been done on risk-taking behavior in children, a few results of such studies will be cited here. On the toggle-switch task, in a study by Slovic (1966), boys between 11 and 16 years of age took more risks than girls; but there were no sex differences between ages 6 and 10. In another study (West, Fretz, & MacDonald, 1970) using the same task, mildly disturbed boys were divided into groups of high and low risk-takers. After participation in a physical development program, both groups moved toward the theoretical level of optimum risk--that is, toward the midpoint (five of nine switches pulled).

On skill tasks the results have been more complicated and more tentative. Boys with a high hope of success and a high fear of failure took more moderate risks than boys low on those dimensions (deCharms & Dave, 1965). In a group of retarded children and adolescents, reward seekers took more intermediate risks, and boys took more high risk shots than girls (McManis & Bell, 1968). For boys who were low on a scale of defensiveness there was a positive correlation between preferred level of risk-taking and creativity (Pankove & Kogan, 1968). Finally, boys cheated more on a game if there was a low risk of being detected and if they knew how their classmates had done on the task (Hill & Kochendorfer, 1969).

The present study was designed to assess the effects of sex of the experimenter and of a child's cognitive style (Kagan, 1966) on risk-taking behavior.

The subjects were 60 fourth grade children, 30 boys and 30 girls, attending a public school in suburban Atlanta, Georgia. All the children were white and middle class. The range of ages was from 9 years-2 months to 10 years-4 months, with the mean being 9 years-8 months. Each child was administered Kagan's Matching Familiar Figures task first; this is a measure of a child's tendency to have a reflective or impulsive cognitive style. On this task the child looks at one standard stimulus line drawing and must point to its exact match from among six alternatives. He is scored for response latency (time from exposure to first response) and number of errors, on each of 12 trials. A child who was above the group median on response time and below the group median on errors was considered reflective. A child who was below the median on response time and above the median on errors was considered impulsive. Each child was then administered the risk-taking task with the danger switch connected. One half the children of each sex performed the two tasks with an adult female experimenter (age 26) and one half with an adult male experimenter (age 28).

No predictions were made about sex of experimenter-sex of subject differences. Sex was simply controlled in an effort to determine whether it would have any differential effects. It was considered more likely that there would be differences due to sex on the risk-taking task than on the more intellectual Matching Familiar Figures task. It was predicted that impulsive children would take more risks than reflective children, since impulsive children

respond faster and do not scan or consider alternatives as much.

Two-way analysis of variance tests were done on the three dependent variables: response time and errors on the Matching Familiar Figures task and number of switches moved on the risk-taking task. The independent or predictor variables for the analyses were sex of experimenter and sex of subject. The only significant finding was a sex of experimenter by sex of subject interaction on the risk-taking task ($F = 4.905$, 1/56 $df$, $p < .05$). The means and standard deviations for each group of subjects were as follows.

| Group | Mean | Std. Dev. |
|---|---|---|
| Male experimenter-male subject | 4.33 | 1.76 |
| Male experimenter-female subject | 6.00 | 1.89 |
| Female experimenter-male subject | 4.93 | 2.40 |
| Female experimenter-female subject | 5.27 | 2.52 |

The only signigicant difference among these four groups was between boys and girls with a male experimenter (Duncan's multiple-range test critical value = 1.67, $p = .05$). Girls moved more switches than boys did with a male experimenter; that is, the girls took significantly more risks in this condition.

None of the correlations between risk-taking and cognitive style measures were significant. The contingency coefficient between these two variables was .201 ($p > .30$). Thus, essentially no relationship was found between these two variables. (The point-biserial correlation between impulsivity and risk-taking was $r = .198$, $p > .10$.)

## Discussion

The study I've just presented attempted to show how risk-taking behavior is related to reflective-impulsive cognitive style, sex of experimenter, and sex of subject factors. The hypothesized positive relationship between impulsivity and level of risk-taking was not found. The most parsimonious interpretation of these data is that there is no relationship between cogintive style and this type of risk-taking behavior, or that cognitive style accounts for a very small amount of variance. Only further investigation can show whether this conclusion can be generalized to other kinds of risk-taking situations which children encounter. Another possibility is that risk-taking behavior may be easier to predict if multiple personality, social, and cognitive variables are considered together at the same time.

A more interesting finding was that the girls in the present study took significantly more risks than boys did when they were with an opposite-sex, male experimenter. In fact, girls also had a larger average score than boys with a female experimenter, although this difference was very small and clearly not significant.

I am now engaged in doing further research in order to determine whether these results can be replicated under more controlled circumstances. It is necessary to control the sex of experimenter factor more adequately since the subjects could have been responding

to particular characteristics of the two experimenters rather than to their sex. Therefore, three male and three female experimenters will each run the toggle-switch task with an equal number of fourth grade boys and girls in order to determine whether girls do tend to take more risks than boys when a man is in charge of the task. Other kinds of studies have found such a cross-sex effect. For example, an opposite sex adult was generally more effective in reinforcing children on learning tasks (e.g., Stevenson, 1964; Gewirtz, Baer, & Roth, 1958). Children also resisted temptation more if rules were laid down by an opposite-sex experimenter as compared with a same-sex experimenter (Mumbauer & Gray, 1970). The study that has just been described is the only risk-taking study that has been done, with this or other tasks, in which girls tended to take more risks than boys ($F = 3.39$, 1/56 df, $p < .10$). So it is very important to attempt to replicate this type of study before making any generalizations about effects of sex on risk-taking behavior.

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Footnote

1. This paper was presented at the annual meeting of the Southeastern Psychological Association, Atlanta, Georgia, April 7, 1972. The author would like to acknowledge the support and cooperation of the principal and teachers at the school where the data were collected and of Carol Kleemeier who served as one of the experimenters and helped with the data analyses. Author's address: Department of Psychology, Emory University, Atlanta, Georgia 30322.

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